

## **Productivity of Moth Bean Intercropped with Fruit Trees**

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The agro climate of western Rajasthan is a challenge for profitable arable cropping due to its climatic adversities. This area receives 100-500 mm annual rainfall (average <265 mm) with 40-70% coefficient of variation in intensity and occurrence. Low and erratic rainfall combined with extreme temperature results in occurrence of consecutive droughts leading to frequent crop failure and severe wind erosion (Rao and Singh, 1998) under annual arable cropping system. The introduction of woody perennials may provide vegetal cover above soil surface, reduce soil erosion and create a microclimate for the intercrops grown between the tree spaces. Under water scarcity conditions, for establishment of woody perennials, drip irrigation system has proved the best, with minimum water requirement and the rainfed kharif intercrops should provide an extra income to the farmers. With this hypothesis, investigations were carried out to find out the performance of rainfed kharif intercrops with different fruit trees raised under drip irrigation system.

### **Materials and Methods**

The experiment was conducted at the Regional Research Station of Central Arid Zone Research Institute, Bikaner, during 2001-03 on sandy loam soil. Moth bean variety RMO-40 was intercropped under rainfed conditions with 4-year-old fruit trees viz. citrus (*Citrus* sp.), bael (*Aegle marmelose*) and gonda (*Cordia myxa*) grown with drip irrigation system, in factorial randomized block design with three

replications. Three irrigation schedules for fruit trees i.e.,  $I_1=100\%$  ETc,  $I_2=80\%$  ETc and  $I_3=40\%$  ETc, were followed. Growth and yield data of intercrops were recorded and analyzed. The fruit trees were planted at 5 m plant-to-plant and 6 m row-to-row spacing. The intercropping was done in between the rows of fruit trees. Recommended doses of fertilizers were applied to the intercrop with no supplemental irrigation. During the crop season (2003) a total of 91.9 mm rainfall was received with an evaporation of 1038 mm.

### Results and Discussions

**Growth of intercrop:** The data presented in Table 1 revealed that fruit trees irrigated at different irrigation levels did not affect the plant height of the crop significantly. Moth bean intercropped with citrus produced highest mean plant height of 21.4 cm, which was higher than that intercropped with gonda and bael. The highest mean number of pods plant<sup>-1</sup> (15.26) in moth bean was recorded in moth bean intercropped with the trees irrigated at 80% ETc level (Table 2). Similar results were obtained by Yadav *et al.* (2005). Among different fruit trees, intercropping of moth bean with citrus produced the highest number of pods plant<sup>-1</sup> (17). This may be due to better canopy development in citrus, reducing the wind speed and creating better microclimate for higher plant height and pod setting in the crop underneath. Intercropping in ber orchards has been found to exert no detrimental effect on the growth of fruit trees (Vashishtha and Prasad, 1997).

Table 1. Mean Plant height of moth bean intercropped with fruit trees

Irrigation level	Plant height (cm)			
	Citrus	Bael	Gonda	Mean
$I_1$	21.23	18.23	22.1	20.52
$I_2$	19.53	22.86	19.1	20.50
$I_3$	23.43	20.9	18.53	20.95
Mean	21.4	20.66	19.91	
CD (P=0.05)	Irrigation NS	Trees 3.082	Irrigation x trees NS	